

**IN THE UNITED STATES PATENT AND TRADEMARK OFFICE**

Inventor(s) : Tadayoshi OKADA et al.  
Serial No. : To be Assigned  
Filed : Herewith (September 12, 2003)  
For : HIGH-STRENGTH BOLTED CONNECTION STRUCTURE  
WITH NO FIRE PROTECTION  
Examiner : To be Assigned  
Art Unit : To be Assigned

**EXPRESS MAIL NO.: EV 343638561 US**

Assistant Commissioner for Patents  
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Alexandria, VA 22313-1450

**PRELIMINARY AMENDMENT**

SIR:

Kindly amend the above-identified application before examination and calculation of the filing fee as follows:

**IN THE ABSTRACT:**

Please amend the originally-filed Abstract as provided below. The modifications are reflected on the Substitute Abstract which is enclosed herewith on separate sheet.

~~The present invention provides a~~ A high-strength bolted connection structure for realizing a steel structure with no fire protection are provided.[,] ~~which~~ The structure is capable of adequately assuring high-temperature strength of 650°C, and ~~which~~ does not depend on a fire protection or protective structure using fire resistant material, ~~wherein~~ In particular, ultra-high

strength bolts having excellent fire resistance and excellent resistance to delayed fracture ~~are~~ can  
be used, which ~~bolt~~ have a tensile strength at room temperature (TS) of 1200 N/mm<sup>2</sup> or higher, and  
~~satisfies~~ satisfy the relation that the sheer proof stress at high temperature of 650°C (~~b<sub>tt</sub>~~) is not less  
than (coefficient of slip at room temperature (~~μ~~) × design bolt tension (~~N<sub>0</sub>~~))/ (safety factor for long  
term load (~~ν~~) × cross-sectional area of bolt shank (~~bAs~~)).

**IN THE SPECIFICATION:**

Please replace the originally-filed Specification (enclosed herewith) with the  
Substitute Specification which is enclosed herewith. A marked-up comparison between the  
originally-filed Specification and the Substitute Specification is also enclosed.

**IN THE CLAIMS:**

Please cancel originally-filed claims 1-9, without prejudice. New claims 10-18  
have been added herein above. According the listing of these claims are as follows:

Claims 1-9 (Cancelled).

10. (New) A high-strength bolted connection structure provided substantially without a fire  
protection, and having a fire resistance of a steel structure which includes at least one of columns  
and beams, the structure comprising:

ultra-high-strength bolts, each of the bolts having a bolt tensile strength of at least 1200  
N/mm<sup>2</sup> at a room temperature and the fire resistance with a bolt shear proof stress at 650°C  
satisfying the following:

$$b_{tt} \geq \mu \times N_0 / (\nu \times bAs)$$